



# NASA Ames Contributions to Space Exploration

## NASAFacts



Blue-lit image of scale model of Crew Exploration Vehicle (CEV) at NASA Ames Research Center, Moffett Field, Calif., in early March 2006, where the model was tested in Ames' Unitary Wind Tunnel Complex.

NASA Ames Research Center, Moffett Field, Calif., is currently supporting the Crew Exploration Vehicle (CEV) and the Crew Launch Vehicle (CLV) directly with the several efforts including development of Thermal Protection System technology, computational modeling and wind tunnel testing, Integrated System Health Management (ISHM) expertise, crew cockpit design expertise, software validation and verification expertise and Simulation Assisted Risk Assessment (SARA) expertise. Many of these activities use unique national assets at NASA Ames such as the Arc Jet, the Unitary Wind Tunnel and the Columbia supercomputer.

### Details below:

1) CEV Thermal Protection System Advanced Development Project (TPS ADP) is a NASA technology development activity led by NASA Ames with teams from NASA Johnson Space Center, Houston; Kennedy Space Center, Fla.; Langley Research Center, Hampton, Va.; and the Jet Propulsion Laboratory (JPL), Pasadena, Calif. This activity's primary objective is to show that a single heat shield design, that meets both lunar return and low-earth-orbit re-entry requirements, is able to be manufactured and is sufficiently understood by NASA to proceed with the flight development.

2) The CEV AeroSciences Project (CAP) is a NASA aerodynamic and aero thermal data base development project led by NASA Johnson with teams from NASA Ames, NASA Langley and JPL. Its primary objective is to develop and verify the aerodynamic and aerothermal database required for the design of the CEV.

3) CEV Integrated System Health Management (ISHM) project is a NASA project lead by NASA Ames with teams from NASA Johnson; JPL; and NASA Kennedy (KSC), Florida. This project's primary objective is to expedite and reduce the cost of CEV processing and refurbishment if performed at Kennedy and to define requirements and improvements to assess CEV health and status during quiescent periods.

4) NASA Ames is providing expertise and test capabilities to the NASA Johnson team designing the crew interfaces in the CEV.

5) NASA Ames is providing software validation and verification expertise and computational capabilities to the CEV software development team at NASA Johnson.

6) NASA Ames is leading a project that performs a Simulation Assisted Risk Assessment of the CLV. The objective of this work is to provide risk information through the modeling and simulation of critical failure modes of the Crew Launch Vehicle.

7) NASA Ames is providing Integrated System Health Management support to the CLV upper stage and vehicle integration projects through trade studies and requirements generation in the areas of fault detection for crew abort and ground checkout at NASA Kennedy.

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